



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Thomas A. Figura et al. § Group Art Unit: 2825  
Serial No: 09/471,460 § § § Examiner: Calvin Lee  
Filed: December 22, 1999 § § § Atty. Docket: 94-0280.03  
For: USE OF A PLASMA SOURCE TO FORM § § §  
A LAYER DURING THE FORMATION § § §  
OF A SEMICONDUCTOR DEVICE § § §

25 | Appeal  
Brief  
1-31-03  
A. Walk

APPLICANTS' BRIEF ON APPEAL

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## APPLICANTS' BRIEF ON APPEAL

### I. REAL PARTY IN INTEREST

The Applicants, Thomas Figura, Kevin Donohoe, and Thomas Dunbar, have assigned their interest in this application to Micron Technology, Inc.

### II. RELATED APPEALS AND INTERFERENCES

There are other appeals or interferences known to the Applicants or the assignee which may directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

The application under appeal shares a common parent application with U.S. App. Ser. No. 09/470,650 (both are divisionals of U. S. App. Ser. No. 09/046,835, filed Oct. 24, 1997 and issued as U.S. Pat. No. 6,117,764). U.S. App. Ser. No. 09/470,650 received an Office Action dated Oct. 24, 2002. Applicants intend on filing a Notice of Appeal on Jan. 21, 2003.

The application under appeal also shares that parent with U.S. App. Ser. No. 09/470,651 (again, both are divisionals). Applicants filed a Notice of Appeal on Jan. 2, 2003.

### III. STATUS OF THE CLAIMS

Claims 1-46 have been presented during prosecution of the application under appeal.

Claims 1-44 have been canceled.

Claims 45-46 are pending.

Claims 45-46 are rejected.

Claims 45-46 are appealed.

### IV. STATUS OF THE AMENDMENTS

Applicants filed no amendments subsequent to final rejection.

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## V. SUMMARY OF THE INVENTION

The current invention includes within its scope a method of providing a material in a site between metal features on a wafer. The acts of that method comprise performing a deposition of the material over the wafer in the site; and etching that material in the same general site used to perform the deposition; wherein the act of etching further comprises etching generally simultaneously with performing the deposition. (Replacement Specification at ¶[0013]-[0018]; FIGS. 1-4.) In a narrower embodiment of this type, the act of performing a deposition further comprises depositing a polymer on the wafer. (*Id.* at ¶[0015]; FIG. 2.)

## VI. ISSUES

There are two issues for determination on appeal:

- (1) whether the Examiner has failed to meet the burden for establishing the §112 rejections; and
- (2) whether the Examiner has failed to meet the burden for establishing the §102 rejections.

## VII. GROUPING

Applicants define the following groups of claims for consideration upon this appeal. These groups correspond to the issues listed above.

Group I: claims 45-46.

Group II: claims 45-46.

## VIII. ARGUMENT

The Examiner rejected claims 45-46 under both §112 and §102. Applicants address each basis for rejection separately below.

A. The Examiner has failed to meet the burden for establishing the §112 rejections

The Examiner rejected claims 45-46 based on 35 U.S.C. §112, ¶2. Independent claim 45 requires etching a material generally simultaneously with performing a deposition of that material. Dependent claim 46 incorporates this limitation. In attempting to support the rejection, the Examiner cited a portion of the Specification that discloses etching a conductive material while simultaneously forming a different layer – an etch resistant layer. (Office Action dated 8/12/02 at p. 2 (citing page 8, line 14, of the original Specification).) Applicants note that the portion of the Specification relied upon by the Examiner concerns a “third embodiment” illustrated in FIGS. 7-8. (Original Specification p. 8, ln. 11-19.) The current application, however, is a divisional application electing the species disclosed in FIGS. 1-4. (See Preliminary Amendment; *see also* Office Action dated 10/20/98 for the parent Application Ser. No. 09/046,835 (requiring a restriction between the patentably distinct species in FIGS. 1-4, 5-6, and 7-8).) Applicants submit that the Examiner’s reliance on text that addresses a non-elected species deemed to be patentably distinct by the Patent Office is insufficient for meeting the Examiner’s burden for rejecting the claims under §112 ¶2.

B. The Examiner has failed to meet the burden for establishing the §102 rejections

The Examiner rejected claims 45-46 as being anticipated by either Chouan (U.S.Pat. No. 5,079,178), Nulty (published European patent application EP 721,205), or Imai (U.S.Pat. No. 6,089,183). The Examiner has previously raised these bases for rejection, and in fact the main arguments in the latest Office Action appear to be lifted verbatim from an earlier Office Action. (*Compare* Office Action dated 8/12/02 at p. 2-4 *with* Office Action dated 3/20/02 at p. 2-4.) Accordingly, Applicants have already refuted these bases for rejection. (See Amendment and Response to the Office Action dated 3/20/02 at p. 3-4.) For the Board’s convenience, the substance of Applicants’ previously raised arguments are presented in the three paragraphs immediately below.

Concerning the European Nulty reference, Applicants note that both its publication date (7/10/96) and filing date (10/25/95) are later than the priority date of the current application – 6/2/95. Even with the recent amendments to §102, Applicants do not understand the European

Nulty reference to be prior art. Nevertheless, Applicants note that Nulty's European application is based on a U.S. application filed 12/7/94 that issued as U.S. Patent No. 5,562,801. (Applicants submitted Nulty's U.S. Patent No. 5,562,801 in an Information Disclosure Statement filed concurrently with the Amendment and Response.) Accordingly, Applicants address the U.S. Nulty patent, as well as the other two U.S. Patents, below.

Applicants contend that the claims contain limitations that Chouan, Nulty, and Imai fail to disclose. As mentioned above, claim 45 requires (1) performing a deposition of a material at a particular site; and (2) etching *that material* in the same general site used to perform the deposition, wherein etching further comprises etching generally simultaneously with performing the deposition. Dependent claim 46 incorporates these limitations.

These limitations are in contrast to Chouan, Nulty, and Imai, which disclose the formation of one material – a polymer – in an opening while etching from *another* material, such as an oxide. (See, e.g., Chouan's Title, col. 2 ln. 39-48, col. 3 ln. 59-61, col. 5 ln. 50-55, FIG. 1C (also demonstrating that the cited deposition and etch occur in different sites); Nulty at col. 2 ln. 39-40, col. 11 ln. 67-col. 12 ln. 2, FIG. 3; and Imai at col. 12 ln 55-61, col. 13, ln. 11-22, FIG. 2B.) Such teachings, disclosing only the opposite of the limitations addressed above, cannot be interpreted to anticipate those limitations.

The Examiner's latest Office Action responded to Applicants' arguments. Significantly, the Examiner admitted that none of the references disclose the claimed etching act. (Office Action dated 8/12/02 at p. 4.) Nevertheless, the Examiner maintained the §102 rejections based on the belief that the Specification did not support such a limitation. As support for this belief, the Examiner cited the same text used to support the §112 rejection addressed above. (Office Action dated 8/12/02 at p. 4-5.) However, as also addressed above, the Examiner's belief concerning the Specification's support is untenable, given that the Examiner's citation is directed to a non-elected species deemed by the Patent Office to be patentably distinct. Hence, the Examiner's statements indicate that the burden for rejecting the claims under §102 has not and cannot be met relying on these references.

### C. Conclusion

The Examiner's §112 ¶2 rejection is based on Specification text that addresses a non-elected embodiment and is therefore insufficient to satisfy the Examiner's burden for such a

rejection. Moreover, the Examiner's §102 rejection is also based on that text and further suffers from the Examiner's admission that the cited references fail to disclose all of the claims' limitations. As a result, Applicants submit that the Board is justified in reversing the Examiner, withdrawing the rejections, and allowing the claims.

Respectfully submitted,

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Appendix 1: Copy of Involved Claims

45. A method of providing a material in a site between metal features on a wafer, comprising:

    performing a deposition of said material over said wafer in said site;

    and

    etching said material in the same general site used to perform said deposition,  
    wherein said step of etching further comprises etching generally simultaneously  
    with performing said deposition.

46. The method in claim 45, wherein said step of performing a deposition further comprises  
    depositing a polymer on said wafer.